MARKED-UP COPY OF AMENDED CLAIMS:

1. (Twice Amended) A planarization method of inter-layer dielectrics, comprising the steps of:

providing a semiconductor substrate [already completing a basic process of forming devices such as] including a field oxide, a source, a drain, and a gate formed thereon;

forming a dielectric layer used as an inter-layer dielectric on said semiconductor substrate, lapping said dielectric layer by means of a chemical mechanical polishing; and

forming on said lapped dielectric layer a cap layer of a refractive index larger than 1.6 [on said lapped dielectric layer] and having a thickness thereof in the range of 300-2000Å.

5. (Amended) The planarization method of inter-layer dielectrics as claimed in Claim 1, wherein said cap layer is a silicon nitride layer [capable of being transmitted by] translucent to ultra-violet light.

6. (Twice Amended) The planarization method of inter-layer dielectrics as claimed in Claim 1, wherein said cap layer is a silicon nitrogen-oxide layer [capable of being transmitted by] translucent to ultra-violet light.

9. (Twice Amended) A planarization method of inter-metal dielectrics, comprising the steps of:

providing a semiconductor substrate having a plurality of metal-interconnects formed thereon;

forming a dielectric layer used as an inter-metal dielectric on said substrate, lapping said dielectric layer by means of a chemical mechanical polishing; and

forming on said lapped dielectric layer a cap layer of a refractive index larger than 1.6 [on said lapped dielectric layer] and having a thickness thereof in the range of 300-2000Å.

16. (Amended) The planarization method of inter-metal dielectrics as claimed in Claim 9, wherein said cap layer is a silicon nitride layer [capable of being transmitted by] translucent to ultra-violet light.

17. (Twice Amended) The planarization method of inter-metal dielectrics as claimed in Claim 9, wherein said cap layer is a silicon nitrogen-oxide layer [capable of being transmitted by] translucent to ultra-violet light.

REMARKS

This case has been carefully reviewed and analyzed in view of the Final Official Action mailed 24 July 2002. Responsive to the outstanding Final Official Action, Independent Claims 1 and 9 have been amended to more clearly emphasize the distinguishing feature of the present invention overlooked by the Examiner; Claims 5 and 6 dependent on Claim 1, as well as Claims 16 and 17 dependent on Claim 9, have been amended to improve the language thereof.

In the Official Action, Claims 1-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Andideh, U.S. Patent #6,191,050, in view of Ang, et al., U.S. Patent #6,232,217.

Prior to discussion of the distinguishing features of the present invention over the cited prior art, it is believed that a brief review of the subject Patent Application method in light of the inventive concept of the Applicant may be beneficial. The subject linearization method of inter-layer dielectric or inter-metal dielectric includes:

formation of an inter-layer dielectric or inter-metal dielectric layer on a semiconductor substrate having an electrical structure formed thereon,

planarization of the dielectric layer, and

creation on the planarized dielectric layer of a cap layer with enhanced anti-reflection properties which are provided by making the cap layer of a high refractive

index larger than 1.6, and by a thickness of the cap layer adjustable within the range of 300-2000Å.

Such a combination of a properly chosen material of the high refractive index larger than 1.6 and of making the thin cap layer of a thickness in the range of 300-2000Å enhances greatly the accuracy of subsequent exposition process.

In addition, by forming the cap layer completely translucent to ultra-violet light, the structure with enhanced capability of data retention is attained.

Turning now to Andideh, cited by the Examiner, it is believed that this reference was cited merely for the purpose of demonstrating formation of a cap layer deposited over a planarized layer. However, Andideh is not concerned with optical properties of the capping layer, and does not appreciate the fact that such optical properties of the capping layer could improve the compatibility of his structure to subsequent (if any) exposition steps or enhanced capability of data retention of the structure.

Ang, et al., similarly to Andideh, disclose a cap layer 20 formed on the top of the planarized dielectric layer 18. The capping layer 20 is made of silica glass, or silicon nitride, or silicon oxynitride, and preferably from silicon-rich oxide (SRO). The thickness of the capping layer 20 is in the range from 500-4000Å, and more preferably from about 1000-3000Å.

It is respectfully submitted that, similar to Andideh, Ang, et al. are not concerned

with optical properties of the capping layer 20 and fail to suggest a specific refraction index of the capping layer 20.

While in the present invention, the cap layer is specifically designed with the refractive index not smaller than 1.6 in order to provide high anti-reflection properties to the capping layer for improving and enhancing the compatibility with subsequent exposition steps.

Moreover, in Ang, et al., the capping layer 20 is of high thickness ranging from 500-4000Å, preferably from 1000-3000Å. Such a thick capping layer 20 unavoidably is detrimental to further photolithographical process, when needed.

While in the present invention, a thin capping layer with the thickness of 300-2000Å is much better suited for subsequent photolithography process than Ang, et al.

Further, since in contrast to the present invention, Ang, et al. are not concerned with optical parameters of the capping layer 20, the transparence to ultra-violet light of the capping layer 20 is not disclosed, or suggested in Ang, et al.

While in the present invention, the cap layer is made of a material translucent to ultra-violet light for improved process of data retention in the structure of the present invention.

Summarizing the above said, it is respectfully submitted that none of the references cited by the Examiner taken singly or in combination, disclose, suggest, or

render obvious the combination of elements, as now claimed by Applicant in Independent Claims 1 and 9, and which is patentably distinct over the resulting structure. Indeed, none of the references discussed in previous paragraphs (Andideh nor Ang, et al.), taken alone or in combination, disclose, suggest or render obvious:

(a) a cap layer of a refractive index larger than 1.6;

(b) a cap layer having a thickness thereof in the range of 300-2000Å.

The claimed combination of elements is not found for the purposes and objectives disclosed in the subject Application even when Andideh and Ang, et al. references are combined as suggested by the Examiner. Accordingly, Claims 1 and 9 are believed to be allowable over Andideh and Ang, et al.; and the same is respectfully urged.

Claims 5 and 6 dependent upon Claim 1, as well as Claims 16 and 17 dependent upon Claim 9, recite "...said cap layer is...translucent to ultraviolet light", the element missing in both prior art references cited by the Examiner taken singly or in combination thereof.

Claims 2-8, dependent upon Claim 1, as well as Claims 10-19 dependent on Claim 9, are believed each to add further limitations that are patentably distinct in addition to being dependent upon what is now believed to be a patentable base Claim and, therefore, allowable for at least the same reasons.

For all of the foregoing reasons, it is now believed that the subject Patent

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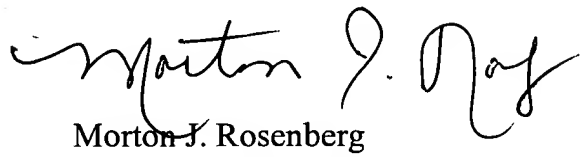
Application has been placed in condition for allowance, and such action is respectfully requested.

Respectfully submitted,



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